

Java Program 1

Concepts

- Objects
- Constructors
- “Getter” Methods
- Instance Methods
- toString()
- Nested loops
- ArrayList class
- Iterator

Description

Define a class called `Card`, each instance of which represents a playing card. The `Card` class should be in a package called `oa3302` (so that the “fully qualified name” is `oa3302.Card`). The class will have two `int` instance variables `suit` and `value` representing two properties of a card object. The `suit` instance variable could represent, for example clubs, diamonds, hearts, or spades for a conventional deck of cards. The `value` instance variable could represent the value of each card; for example, 2, 3,..., Queen, King, Ace. These variables should be set in the constructor and never changed. Thus, there should not be “setter” methods for these properties. They should, however, have “getter” methods. Finally, write a `toString()` method that returns the card's suit and value, as shown in the output below.

Although your `Card` class should be capable of being used in a “conventional” 52 card deck, it should be flexible enough to be used in other decks (e.g. Pinochle or Canasta).

Write a main method in a class called `TestCard` in which you define an `ArrayList` called `deck` to contain the cards for a conventional 52-card deck. Don't forget that `ArrayList` belongs to the `java.util` package (So you should import `java.util.*`). Using nested `for` loops (in the main method), instantiate 52 cards representing all the different cards in an ordinary deck and place them in the deck. To print the deck out, write a single `for` loop that uses an `Iterator` (obtained from `deck` by its `iterator()` method).¹ For each card in the deck, print it out using `toString()` implicitly so that you do not have to cast the objects to `Card`. The output should look like this:

```
value=0 suit=0
value=1 suit=0
value=2 suit=0
value=3 suit=0
value=4 suit=0
value=5 suit=0
value=6 suit=0
value=7 suit=0
value=8 suit=0
value=9 suit=0
value=10 suit=0
```

1. The loop to print out the deck should therefore look like:

```
for (Iterator i = deck.iterator(); i.hasNext(); ) {
    System.out.println(i.next());
}
```

```
value=11 suit=0
value=12 suit=0
value=0 suit=1
value=1 suit=1
value=2 suit=1
value=3 suit=1
value=4 suit=1
value=5 suit=1
value=6 suit=1
value=7 suit=1
value=8 suit=1
value=9 suit=1
value=10 suit=1
value=11 suit=1
value=12 suit=1
value=0 suit=2
value=1 suit=2
value=2 suit=2
value=3 suit=2
value=4 suit=2
value=5 suit=2
value=6 suit=2
value=7 suit=2
value=8 suit=2
value=9 suit=2
value=10 suit=2
value=11 suit=2
value=12 suit=2
value=0 suit=3
value=1 suit=3
value=2 suit=3
value=3 suit=3
value=4 suit=3
value=5 suit=3
value=6 suit=3
value=7 suit=3
value=8 suit=3
value=9 suit=3
value=10 suit=3
value=11 suit=3
value=12 suit=3
```

Deliverables

Turn in hard copies of your source code for your two classes (`Card` and `TestCard`) and the output from your program.